2007 RESEARCH PROBLEM STATEMENT

Problem Title: Flexible Pavement - Structural Condition Index **No.:** 07.03-04

Submitted By: Gary Kuhl **Email:** gkuhl@utah.gov

Project Champion: Gary Kuhl

(UDOT or FHWA employee who needs this research done, will help the Research Division lead this project, and will spearhead the implementation of the results. If the project gets prioritized at the UTRAC conference, a Champion Commitment Form will be required before funding.)

1. Briefly describe the problem to be addressed.

Develop a structural index for flexible pavement, based on FWD data, that can be used for reporting the system condition – and more importantly, that can be used to discriminate between pavements requiring additional structural capacity and those for which a surface treatment would be sufficient.
Current pavement condition reporting & modeling is primarily based on surface condition data. Structural capacity is a significant data element needed to capture the complete level of condition.

2. Strategic Goal: ☒ Preservation ☐ Operation ☐ Capacity ☐ Safety (check all that apply)

3A. List the research objective(s) to be accomplished:

1. Create an inventory of structural condition for our pavement sections using FWD and Traffic information. Develop/identify storage repository for all field data.
2. Determine which pavements to include. Do low volume pavements need to be tested??
3. Identify components of test data that can be used to create index.
4. Determine Methodology. Modulus based, SN based, include cracking data, etc.
5. Validate methodology through field study or test section.
6. Keep it simple

3B. List the major tasks to accomplish the research objective(s): **Estimated person-hours:** 500

1. Literature search and national survey to identify other practices being used.
2. Determine appropriate methodology, i.e. calculated effective SN values vs required SN values. Compare effective SN measured to design SN.
3. Determine if different pavement types need different parameters. Categorize pavement types & identify parameters
4. Establish network level testing requirements – based on number needed per section, or mile by mile
5. Test and validate methodology & sampling
6. Update pavement thickness data – review GPR data, construction history. Update FWD analysis.
7. Review how can this Index be included in the dTIMS condition modeling. Should the fatigue cracking be factored in.
8. Develop new UDOT pavement management procedures

4. Estimate the cost of this research study including implementation effort (use person-hours from No. 3B): $70,000

5. Indicate type of research and/or development project this is

Large: ☒ Research Project ☐ Development Project
Small: ☐ Research Evaluation ☐ Experimental Feature ☐ New Product Evaluation ☐ Tech Transfer Initiative
☐ Other: _____

(A small project is usually less than $20,000 and shorter than 6 months)

6. Outline the proposed schedule (when do you need this done, and how will we get there):
Approximately 2 year project. Majority will be field data acquisition. Approximately 6 months for model development. 6 Months for field test for validation.

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7. What type of entity is best suited to perform this project (University, Consultant, UDOT Staff, Other Agency, Other)?

Someone knowledgeable in pavement materials & FWD data processing and analysis.
University, UDOT, Consultant

8A. What deliverables would you like to receive at the end of this project? (e.g. useable technical product, design method, technique, training, workshops, report, manual of practice, policy, procedure, specification, standard, software, hardware, equipment, training tool, etc.)

1. Testing procedure – number of test / section & frequency needed.
2. FWD data processing formulas.
3. Index calculation formulas.
4. Pavement sections categorized for appropriate formulas.
5. Summary of methodology and results.

8B. Describe how this project will be implemented at UDOT.

1. FWD testing will be adjusted to accomplish this need.
2. FWD data processing will be adjusted to provide the appropriate Index inputs.
3. Structural Index values will be reported as part of the condition reports.
4. Structural Index values will be modeled to identify & prioritize structural projects.
5. Adjustments will be managed by Pavement Management Group and incorporated into Pavement Management model and program.

8C. Describe how UDOT will benefit from the implementation of this project, and who the beneficiaries will be.

Pavements will be treated more equitably with a statewide inventory of more complete condition information. Will lead to better network level decisions, more appropriate project identification and better pavement economics through life-cycle.

9. Describe the expected risks and obstacles as well as the strategies to overcome them.

Non anticipated.

10A. List other people (UDOT and non-UDOT) who are willing to participate in the Technical Advisory Committee (TAC) for this study:

Name	Organization / Division / Region	Phone	Email
Gary Kuhl	Systems Planning and Programming	964-4552	gkuhl@utah.gov
Brent Hadfield	Materials	965-4835	bhadfield@utah.gov
Russ Scovil	Systems Planning and Programming		
Austin Baysinger	Systems Planning and Programming	965-4846	abaysinger@utah.gov

10B. Identify other Utah, regional, or national agencies and other groups that may have an interest in supporting this study: